REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow. Claims 36-65 are pending in this application.

I.   Allowance of Claims 40, 41, 43-47, 55, 56, 58, 62, 63, and 65

Applicant thanks the Examiner for recognizing that Claims 40, 41, 43-47, 55, 56, 58, 62, 63, and 65 are allowable over the cited art. However, Applicant believes that the remaining claims are also allowable over the cited art.

II.   Rejection of Claims 36, 39, 42, 48-51, 54, 57, 59, 61, and 64 under 35 U.S.C. § 103(a)

In section 2 of the Office Action, Claims 36, 39, 42, 48-51, 54, 57, 59, 61, and 64 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,804,532 to Moon et al. (Moon) in view of U.S. Publication No. 2002/0142789 to Kuhl et al. (Kuhl). Applicant respectfully disagrees because Moon and Kuhl, alone and in combination, fail to teach, suggest, or disclose all of the elements of at least Claims 36, 51, and 59.

A.   *Rejection of Claims 36, 51, and 59 under 35 U.S.C. § 103(a)*

Independent Claim 1 recites in part:

> calculating a connectivity metric for a plurality of links defining
> each of a plurality of routes that connect a start node with an
> end node, ... wherein the calculated connectivity metric for a
> link of the plurality of links is determined based on the first
> type of node and the second type of node;

Independent Claims 51 and 59 recite a similar element.

On pages 3-4 of the Office Action, the Examiner states:

> Moon et al also do not disclose wherein the calculated
> connectivity metric for a link of the plurality of links is
> determined based on the first type of node and the second type
> of node.
>
> Kuhl et al disclose that in a Bluetooth piconet, the nodes much
> [sic] know the master/slave definitions so that the network can

react flexibly to different network conditions such as a change in topology. For example, a slave can refuse an order from a master if he is occupied with an order from another higher-ranking master. So, <u>the network topology and master/slave assignments must be defined in a network</u> so that a path can be determined since a slave must know which master it is to receive orders from. Refer to Section 0013. <u>Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node</u>. One would have been motivated to do so in order so that a path through the network and the cost of the path can be determined. For example, <u>a slave in between two piconets must know whether the next hop is a slave or a master, and if it is a master node, the slave must know if it has to receive orders from it</u>.

(Emphasis added through underlining).

Applicant agrees that Moon fails to teach, suggest, or describe "wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59. Applicant, however, fails to understand how, even if "the network topology and master/slave assignments must be defined in a network," this relates to or in any manner makes obvious "wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node" as stated by the Examiner. Even if it is true that "the network topology and master/slave assignments must be defined in a network" as described by Kuhl, which Applicant does not necessarily concede, neither Moon nor Kuhl teach, suggest, or describe "wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59. Mere knowledge of the type of node does not render obvious use of the type of node in the calculation of a connectivity metric. Thus, Moon and Kuhl, alone and in combination, fail to teach, suggest, or disclose all of the elements of at least Claims 36, 51, and 59. Additionally, Applicant respectfully submits that there is no motivation to combine Moon with Kuhl for the reasons discussed further below.

1.   Failure to teach, suggest, or disclose all of the claim elements

Moon describes "a method for re-routing communications based on link quality ...."
(Abstract). Relative to this method, Moon states:

> A metric is a standard of measurement that is used by routing
> algorithms to determine the optimal path to a
> destination...Examples of traditional metrics that have been
> used are path length, reliability, latency, bandwidth, load, and
> communication cost. Path length is the most common routing
> metric. In some instances, path length may be based on the sum
> of a "cost" associated with each network link that is included in
> a particular path. The "cost" of a particular link is typically
> assigned by a network administrator. Other routing protocols
> define path length as the number of routers or other
> internetworking devices through which a packet must travel en
> route from a source to a destination. This is typically referred to
> as a "hop count."

(Col. 9, lines 10-26; emphasis added). Thus, the "metric" of Moon is a traditional metric
such as path length, reliability, latency, bandwidth, load, communication cost, and hop count.
Moon, however, fails to teach, suggest, or describe use of a "connectivity metric"
"determined based on the first type of node and the second type of node" as recited in Claims
36, 51, and 59.

The Examiner recognizes that Moon fails to "disclose wherein the calculated
connectivity metric for a link of the plurality of links is determined based on the first type of
node and the second type of node." (Page 3, of the Office Action). The Examiner looks to
Kuhl to provide this teaching. Applicant respectfully disagrees.

Kuhl describes a "[m]ethod of prioritising the usage of slotted links by single network
devices in a wireless network for adapting to varying traffic loads." (Abstract). At paragraph
[0013] cited by the Examiner, Kuhl states:

> Advantageously, a first level of priority distinguishes between
> master and slave. A binary version of the master/slave concept
> may be sufficient for substantially linear network structures in
> which for example the main transmission direction may be
> inverted globally. In flexible network topologies with
> interconnection in which a single network device can be

> connected to more than one master, a binary master/slave
> concept is insufficient. In interconnected network structures a
> graduated master/slave concept can be applied, in which a slave
> can refuse an order from a master, if he is occupied with an
> order from another higher-ranking master. ....

Relative to the priority, Kuhl states that "there is provided a method of prioritising the usage of slotted links by single network devices in a wireless network for adapting to varying traffic loads." (Para. [0010]). Thus, Kuhl describes prioritizing usage of slotted links. In addition, Kuhl teaches the ability to distinguish "between master and slave." (Para. [0013]). However, Kuhl fails to teach, suggest or describe anything related to "selecting a route for communicating information in a communication network." Prioritizing slot usage is not related to selecting a route used to communicate information, but merely to determining a time window in which a device is permitted to communicate.

Therefore, Kuhl fails to describe any calculation of a connectivity metric whatsoever. Further, Kuhl fails to teach, suggest, or describe "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59. Thus, neither Moon nor Kuhl teach, suggest, or describe "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59.

2. *No Motivation to Combine*

Additionally, there is no motivation to combine Moon with Kuhl. On page 3 of the Office Action, the Examiner states:

> One would have been motivated to do so in order so that a path
> through the network and the cost of the path can be determined.
> For example, <u>a slave in between two piconets must know</u>
> **<u>whether the next hop is a slave or a master, and if it is a</u>**
> <u>master node, the slave must know if it has to receive orders</u>
> <u>from it.</u>

(Emphasis added through underlining and bolding). Kuhl, however, states:

FIG. 1 shows a topology consisting of devices 1-6 and communication links between the devices 1-6 are given. Communication links are point-to-point and are used to exchange data or control packets between the two devices involved. **One of the two devices participating in a communication link is the master M of the link while the other one is the slave S**. …. A device 4 may only communicate over one communication link with one other device (only device 5 is shown in the drawing) at the time. In order to communicate over several links 43, 45, 46 a device must switch between communication links 43, 45, 46 using a time division multiplex scheme. Communication between two devices 4, 5 over a communication link 45 is only possible if both devices use the same communication link 45 at the same time.

It is assumed that the slave device 5 knows the communication parameters of the master device 4 including the slot numbers N_{slot}. A slave device 5 is **only** allowed to send a packet if the master device 4 polls it. This may happen using a normal data packet, or using a control packet containing no data (a so-called NULL packet). The slave device 5 is required to respond to every master device 4 packet by sending any packet (with or without data). Packets that use more than a single slot are possible. The **master of each link** defines the communication parameters and the priority parameters (the values of MIS, $N_{inter\_contacts}$) of the links.

(Paras. [0052]-[0053], emphasis added through underlining and bolding). Thus, the purported motivation for combining Moon with Kuhl provided by the Examiner would change the principal of operation of Kuhl because a slave only communicates with a master. Therefore, the slave knows that the "next hop" is to a master of the link. A device may act as a master in a first network and as a slave in a second network, but in a link between two devices one device is a master relative to the second device which is a slave.

Additionally, Kuhl is directed to prioritization of the usage of communication links in time and not to determining routes. In fact, Kuhl fails to consider any determination of routes because there is only one route between any two nodes within the Bluetooth network described in Kuhl and each link of the route is between a master device and a slave device.

In contrast, Moon is directed to:

transparent "re-routing" of communications by the mobile
station from one communication link to another as the link
quality of a communication link being used decreases and as
other communication links become available. Furthermore,
such transparent re-routing or "handoff" is provided **between**
diverse communication networks and technologies.

(Col. 2, lines 20-26, emphasis added through underlining and bolding). Moon states:

> As with heterogeneous handoffs between the different cellular
> systems described above, handoffs **between the other wireless**
> and wireline technologies illustrated in FIG. 2 (or **between**
> these other wireless and wireline technologies and one or more
> of the cellular systems), when available, may also result in
> noticeable degradation or interruption of an ongoing
> communication session if the handoff is controlled by devices
> associated with the various technologies. Moreover,
> heterogeneous handoffs between particular networks or devices
> may not be possible if the devices or networks are not capable
> of communicating with one another to transfer an ongoing
> communication from one network or stand-alone device to
> another.
>
> These problems associated with heterogeneous handoffs
> **between** diverse technologies are caused (at least in part)
> because the handoff has typically not been controlled by mobile
> station 20, but with selected devices in the various networks
> (for example, MSCs 12 and controllers 16 in network 10,
> routers in a WLAN, or other similar devices). However, since
> each of these diverse technologies uses different
> communication and signaling techniques and may not be able to
> communicate with other technologies, it is difficult (and
> sometimes infeasible or impossible) to provide handoff of
> communications from one technology to another.

(Col. 6, lines 11-34, emphasis added through underlining and bolding). Thus, Kuhl and

Moon are directed to completely different problems. Kuhl is directed to prioritization of time

slot usage within a network, and Moon is directed to re-routing of communications as a

mobile station moves between different types of networks. As described in Kuhl,

communication is only between a master and a slave under control of the master. (*See* para.

[0053]). Thus, it is nonsensical to use a prioritization based on the type of node in the system

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described in Kuhl. The communications are always between a master and a slave. Therefore, there is no motivation to combine Moon with Kuhl.

According to MPEP § 2143,

> To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Applicant respectfully submits that the Examiner has failed to demonstrate that there is a suggestion or a motivation to combine the teachings of Kuhl with the teachings of Moon. Applicant further respectfully submits that the Examiner has failed to demonstrate that Moon and Kuhl, alone or in combination, teach, suggest, or disclose all of the elements of at least Claims 36, 51, and 59. Therefore, a prima facie case of obviousness has not been established. The remaining claims depend from one of Claims 36, 51, or 59. Therefore, Applicant respectfully requests withdrawal of the rejection of Claims 36, 39, 42, 48-51, 54, 57, 59, 61, and 64.

B. _Rejection of Claims 42, 57, and 64 under 35 U.S.C. § 103(a)_

Claims 42, 57, and 64 recite "determining the total connectivity metric of a route of the plurality of routes comprises identifying a maximum connectivity metric of the plurality of links defining the route." On page 5 of the Office Action, the Examiner states:

> Referring to claims 42, 57 and 64, Moon et al disclose wherein determining the total connectivity metric of a route of the plurality of routes comprises identifying a maximum connectivity metric of the plurality of links defining the route. A metric can be path length, reliability, latency, bandwidth, load, and communication cost. <u>Path length, for example, is based on the sum of a cost associated with each link that is included in a particular path. Adding up the cost of each link and determining the optimal path involves determining the maximum link costs.</u> Refer to Column 9, lines 9-27.

(Emphasis added through underlining). Applicant respectfully disagrees and submits that the Examiner is misreading the claim language. Whether or not adding up the cost determines a maximum link costs, Moon fails to teach, suggest, or describe "identifying a maximum connectivity metric of the plurality of links defining the route" as the total connectivity metric as recited in Claims 42, 57, and 64.

As stated in Claims 36, 51, and 59 from which Claims 42, 57, and 64 depend, "the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node" and "a total connectivity metric for each of the plurality of routes based on the calculated connectivity metric for the plurality of links defining each of the plurality of routes" is determined. (Emphasis added through underlining). According to Claims 42, 57, and 64, "the total connectivity metric of a route of the plurality of routes comprises identifying a maximum connectivity metric of the plurality of links defining the route." Thus, according to Claims 42, 57, and 64, the total connectivity metric of a route comprises a maximum connectivity metric of a link of the plurality of links defining the route and not a sum of the connectivity metric of the links defining the route as stated by the Examiner and described in Moon.

Therefore, Applicant respectfully submits that Moon and Kuhl, alone and in combination, fail to teach, suggest, or disclose all of the elements of Claims 42, 57, and 64. As a result, Applicant respectfully requests withdrawal of the rejection of Claims 42, 57, and 64 for this additional reason.

C.   *Rejection of Claim 50 under 35 U.S.C. § 103(a)*

Claim 50 recites "wherein the calculated connectivity metric is inserted into the routing protocol packet in place of a hop number." On page 6 of the Office Action, the Examiner states:

> Referring to claim 50, Moon et al disclose wherein the calculated connectivity metric is inserted into the routing protocol packet in place of a hop number. A metric can be path length, reliability, latency, bandwidth, load, communication cost, or hop count. Since the connectivity metric can be other parameters besides the number of hops, the value of the

> connectivity metric can be inserted into the routing protocol
> packet in place of the hop number. Refer to Column 9, lines 9-
> 27.

Applicant respectfully disagrees. Moon does not teach "the calculated connectivity metric is inserted into the routing protocol packet in place of a hop number" as stated by the Examiner. Applicant has reviewed the cited section of Moon, and Moon in its entirety, and can find no support for such an assertion. Therefore, Applicant respectfully submits that Moon and Kuhl, alone and in combination, fail to teach, suggest, or disclose all of the elements of Claim 50. As a result, Applicant respectfully requests withdrawal of the rejection of Claim 50 for this additional reason.

III.   Rejection of Claims 37, 38, 52, 53, and 60 under 35 U.S.C. § 103(a)

In section 3 of the Office Action, Claims 37, 38, 52, 53, and 60 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Moon in view of Kuhl and further in view of U.S. Publication No. 2003/0119538 to Momosaki et al. (Momosaki). Applicant respectfully disagrees because Moon, Kuhl, and Momosaki, alone and in combination, fail to teach, suggest, or disclose all of the elements of Claims 36, 51, and 59, and of Claims 37, 38, 52, 53, and 60.

A.   *Rejection of Claims 36, 51, and 59 under 35 U.S.C. § 103(a)*

As discussed in Section II.A., Moon and Kuhl fail to teach at least "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59. Momosaki states:

> In FIG. 2 to FIG. 7, the upstream side device becomes a master
> and the downstream side device becomes a slave, and at most
> seven slaves can be connected to a single master. The
> bandwidth is shared by these eight terminals, so that there is a
> possibility for becoming impossible to secure the bandwidth
> necessary for the data transmission if the number of slaves is
> increased. Here, the necessary throughput is changed according
> to the requested quality of the contents data 26, so that it is
> possible to reduce the number of slaves that can be connected
> according to the necessary throughput.

> It is also possible to set the number of slaves that can be
> connected in accordance with the throughput necessary for the
> transmission of the contents data 26, according to the contents
> data 26 received from the upstream side device. For example,
> when there is a bandwidth of 720 kbps available for
> communication from the upstream side toward the downstream
> side, and the contents data 26 requires 180 kbps, the number of
> slaves that can be connected is limited to at most four.

(Paras. [0075]-[0076], emphasis added through underlining). Thus, Momosaki is directed to sharing bandwidth wherein the number of slaves may be reduced or set in order to secure the bandwidth necessary for data transmission. However, Momosaki fails to teach, suggest or describe anything related to "selecting a route for communicating information in a communication network." Sharing bandwidth is not related to selecting a route used to communicate information, but merely to determining a number of slave devices which can communicate given an amount of bandwidth required for a communication. Momosaki also fails to teach, suggest, or describe "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59.

A rejection under 35 U.S.C. § 103(a) cannot be properly maintained where the references used in the rejection do not disclose all of the recited claim elements. Claims 37, 38, 52, 53, and 60 depend from one of Claims 36, 51, or 59. Therefore, Applicant respectfully requests withdrawal of the rejection of Claims 37, 38, 52, 53, and 60.

B.   _Rejection of Claims 37, 38, 52, 53, and 60 under 35 U.S.C. § 103(a)_

Claims 37, 38, 52, 53, and 60 recite "the connectivity metric is a number of slave nodes in the sub-network." On pages 5-6 of the Office Action, the Examiner states:

> Momosaki et al disclose ..., since the bandwidth is shared
> equally amongst all nodes, the number of slaves cannot
> increase, so the number of the node's slaves must be known to
> ensure that it does not go over the bandwidth threshold. The
> number of slaves is also needed in order to determine the cost
> of the link, since cost is associated with metrics such as
> bandwidth and load. Refer to Sections 0075-0076. Therefore, it

would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein, if the first node is the first master node in a sub-network of the communication network and the second node is the second slave node in the subnetwork, the connectivity metric is a number of slave nodes in the sub-network. One would be motivated to do so in order to determine the number of slaves since the number of slaves is related to the metrics of bandwidth and load. The total amount of bandwidth required by all the nodes must not exceed the total amount of bandwidth provided to the system, which must be shared equally amongst all nodes.

(Emphasis added through underlining). Applicant respectfully disagrees and fails to understand how knowledge of the number of slaves relates to or in any manner makes obvious "the connectivity metric is a number of slave nodes" as recited in Claims 37, 38, 52, 53, and 60. Mere knowledge of the number of slaves does not render obvious use of the number of slaves as a connectivity metric.

Additionally, in the cited paragraphs [0075]-[0076], Momosaki does not state that "the bandwidth is shared equally amongst all nodes" as stated by the Examiner. In fact, Momosaki does not even use the term "equal" with reference to the shared bandwidth at all. Further, Momosaki does not state that "the number of slaves cannot increase" as stated by the Examiner. Momosaki states that "that there is a possibility for [it] becoming impossible to secure the bandwidth necessary for the data transmission if the number of slaves is increased." (Para. [0075]). Momosaki merely teaches that the number of slaves can be set or reduced based on the bandwidth necessary for a data transmission.

Therefore, Applicant respectfully submits that Momosaki fails to teach, suggest, or disclose all of the elements of Claims 37, 38, 52, 53, and 60. As a result, Applicant respectfully requests withdrawal of the rejection of Claims 37, 38, 52, 53, and 60 for this additional reason.

Applicant believes that the present application is in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.
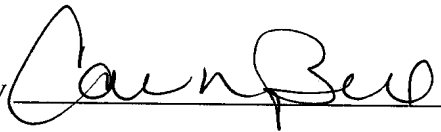
The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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By _____

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